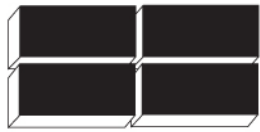


# Ellsworth Air Force Base Advanced Metering Project

**A Partnership between Ellsworth AFB and MDU  
Resources Group, Inc. to install advanced metering  
on all large buildings on EAFB**



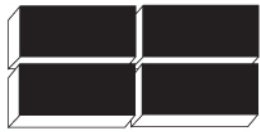


# MDU RESOURCES

*GROUP, INC.*

- Based in Bismarck, North Dakota
- Celebrated our 85<sup>th</sup> year in 2009
- NYSE - MDU for over 60 years
- Over \$4B market cap
- Fortune 500 Company
- Member of the S&P MidCap 400 Index
- Over 8,000 employees in 44 states



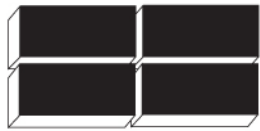


# MDU RESOURCES

*GROUP, INC.*

- Business Lines:
  - Energy
  - Utility Resources
  - Construction Materials





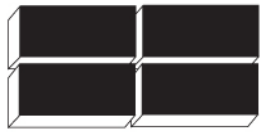
# MDU RESOURCES

*GROUP, INC.*

- Construction Materials
- Energy
  - Oil and Gas Production
- Utility Resources
  - Natural Gas Pipelines
  - Construction Services
  - Electric / Natural Gas Utilities







# MDU RESOURCES

*GROUP, INC.*

- Utility Resources
  - Montana – Dakota Utilities Co.
  - Cascade Natural Gas Co.
  - Intermountain Gas Corporation
  - Great Plains Natural Gas Co.
    - About 950,000 customers
    - ND, SD, WY, MT, WA, OR, ID, MN
  - Bitter Creek Pipelines, LLC
    - Non-Regulated sister company



# PARTNERSHIP ...

- Ellsworth and MAFB – Montana Dakota Utilities Co. Service Area
- Ellsworth AFB pro-active approach to energy management
- Ellsworth AFB and the MDU Resources Group, Inc. have a well developed partnership having completed numerous projects over the past decade
  - Propane Air Mix Plant / Expansion
  - Two UESC Task Orders



# UESC Task Order One...

- Involved the installation of energy efficiency equipment such as new lighting systems, new windows, metering, natural gas pipeline looping along with the heating projects.
- This work was done on 11 buildings, on the base and was completed in 2001.

Total Cost = \$875,000

Expected Annual Savings = \$174,000





# UESC Task Order Two...

- Involved 51 buildings on base.
- Involved new lighting systems, energy efficient windows, heating and cooling system replacement and air de-stratification projects.

Total Cost = \$4.3 million

Expected Annual Savings = \$427,000





# The Partnership Continues...

- When EPACT 05 was passed mandating the installation of advanced electrical metering on all large buildings, EAFB and MDU Resources Group, Inc. again joined forces
- Montana-Dakota Utilities Co. was in the process of integrating advanced metering throughout their service territories in seven states for approximately 1 million gas and electric customers



# Project Specifics

- Methodology for EAFB System
  - Utilize a wireless system (Itron)
    - Rely on extensive research done by MDU for their system
    - Ensure compatibility with MDU data gathering and storage system
  - Concentrate on getting basic data.
    - Linking the data with EMCS systems is outside the scope of the project
    - Controlling HVAC systems is outside the scope of the project./
  - Make Bitter Creek responsible for all aspects of the project/system.



# Project Specifics...(continued)

- Methodology for EAFB System
  - Meter Installation
    - Electric
    - Natural Gas
    - Water
  - Data Gathering System
    - Towers
    - Server
  - Web based data display system
    - Open protocol software
    - Customized to meet EAFB's needs





# Electric Meter Installations



- Electric Meter installed on Transformers



- Electric Meter with ERT

# Natural Gas Meter Installations

- Small Gas Meter with ERT



- Large Gas Meter with ERT



# Water Meter Installations



- Water Meter with ERT



- Remote Water ERT



# Collectors



# Data Usage...

- Project Programming (ACES)
  - Readily available data enables EAFB to identify potential energy saving projects
  - Metered data allows EAFB personnel to justify projected project savings
- Usage Reporting (DUERS)
- Usage Validation
  - Validate Purchased Utility Invoices
  - Validate Reimbursable Utility Invoices



# Data Usage...(continued)

- Increased accountability for utility consumption
  - Building Managers
  - Building occupants
  - Reimbursable customers
- Improve ability of EAFB to respond to utility rate filings and negotiate more favorable utility rates





# General Overview...

- Turn-key project development
- Proven technology
- Customizable / Expandable



# ?

# Questions

